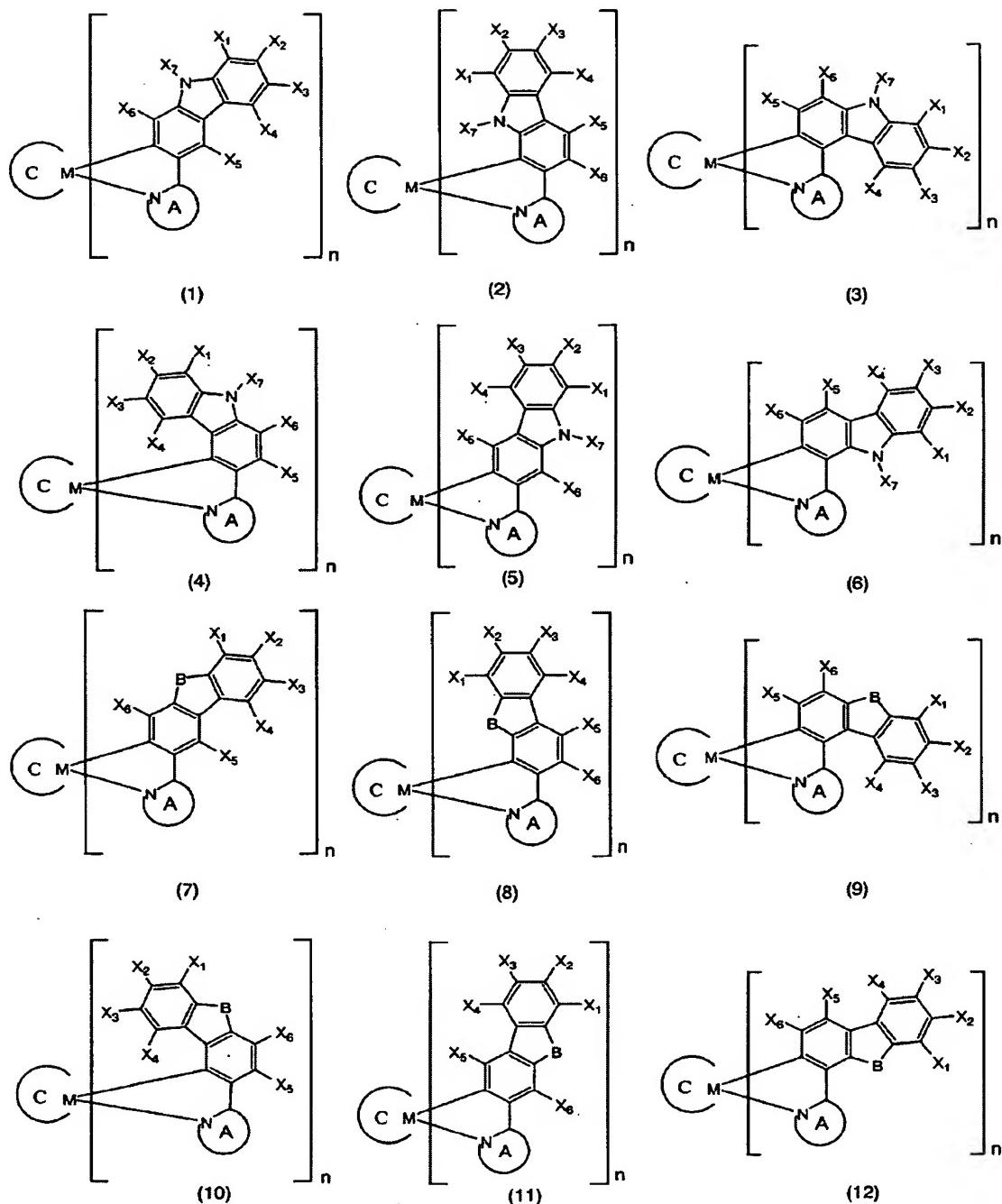


Claims

1. A metal coordination compound-containing copolymer comprising:
a metal coordination compound monomer unit represented by any one
5 of Formulae (1) to (12),



B : >O, >S, >C=O, >SO₂, >CR₂

(in the formulae, M is Ir, Rh, Ru, Os, Pd, or Pt, and n is 1 or 2; ring A is a cyclic

compound containing a nitrogen atom bonded to M; X₁ to X₇ and R are independently substituents selected from the group consisting of -R¹, -OR², -SR³, -OCOR⁴, -COOR⁵, -SiR⁶R⁷R⁸, and -NR⁹R¹⁰ (here, R¹ to R¹⁰ are a hydrogen atom, a halogen atom, a cyano group, a nitro group, a C1 to C22

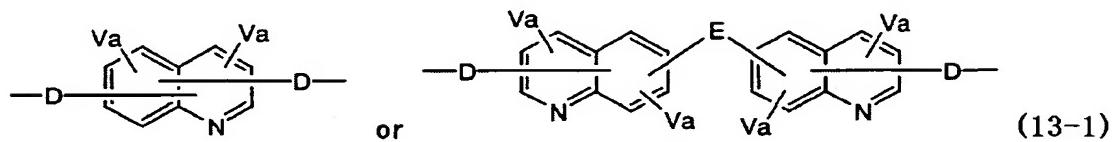
5 straight-chain, cyclic, or branched alkyl group or a corresponding halogen-substituted alkyl group in which a part or all of the hydrogen atoms are substituted by a halogen atom, a C6 to C30 aryl group, a C2 to C30 heteroaryl group, or a C7 to C30 aralkyl group, or a corresponding halogen-substituted aryl group, halogen-substituted heteroaryl group, or halogen-substituted aralkyl group, in which a part or all of the hydrogen atoms are substituted by a halogen atom, and R¹ to R¹⁰ may be identical to or different from each other), X₁ to X₇ may be identical to or different from each other, and ring A may have a substituent that is the same as the groups defined by X₁ to X₇; ring C is a compound that is bonded to M and that bonds to a linking group; and ring C 10 may have a substituent that is the same as the groups defined by X₁ to X₇); and

15 at least one type of monomer unit selected from the group consisting of a substituted or unsubstituted quinoline monomer unit, a substituted or unsubstituted arylene and/or heteroarylene monomer unit, a substituted or unsubstituted branched monomer unit, and a substituted or unsubstituted 20 conjugated monomer unit.

2. The metal coordination compound-containing copolymer according to Claim 1, wherein the copolymer comprises

25 a metal coordination compound monomer unit represented by any one of the Formulae (1) to (12),

a substituted or unsubstituted quinoline monomer unit represented by Formulae (13-1),



(in the formulae, a plurality of V are independently substituents selected from the group consisting of -R¹, -OR², -SR³, -OCOR⁴, -COOR⁵, and -SiR⁶R⁷R⁸ (here, R¹ to R⁸ are a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), may be identical to or different from each other, and are bonded to a substitutable position of a quinoline residue, and each a is independently an integer of 0 to 3; D is selected from the group consisting of a single bond and arylene; and E is a divalent linking group selected from the group consisting of a single bond, -O-, -S-, -C(O)-, -S(O)-, -S(O₂)-, -W-, -(-O-W-)m-O- (m is an integer of 1 to 3), and -Q- [in the formulae, W is a divalent group selected from the group consisting of -Ra-, -Ar'-, -Ra-Ar'-, -Ra'-O-Ra'-, -Ra'-C(O)O-Ra'-, -Ra'-NHCO-Ra'-, -Ra-C(O)-Ra-, -Ar'-C(O)-Ar'-, -Het'-, -Ar'-S-Ar'-, -Ar'-S(O)-Ar'-, -Ar'-S(O₂)-Ar'-, and -Ar'-Q-Ar'-; Ra is alkylene, Ar' is arylene, each Ra' is independently a group selected from the group consisting of alkylene, arylene, and a mixed alkylene/arylene group, Het' is heteroarylene, and Q is a divalent group containing a quaternary carbon]), and a substituted or unsubstituted arylene and/or heteroarylene monomer unit,

the monomer units each being bonded via a linking group represented by Formula (14),

- (G) b - (1 4)

(in the formula, G is a divalent group selected from the group consisting of -O-, -R-O-R-, -S-, -NR-, -CR₂-, -SiR₂-, -SiR₂-O-SiR₂-, and -SiR₂-O-SiR₂-O-SiR₂- (here, R is a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), and b is an integer of 0 or 1).

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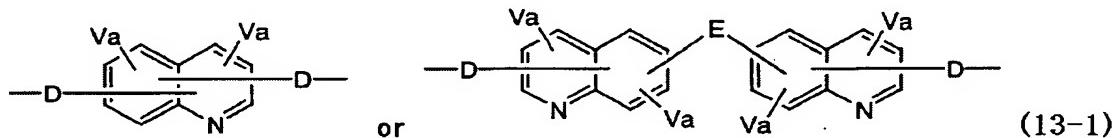
3. The metal coordination compound-containing copolymer according to
Claim 1, wherein the copolymer comprises

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a metal coordination compound monomer unit represented by any one

of the Formulae (1) to (12),

a substituted or unsubstituted quinoline monomer unit represented by
Formulae (13-1),



(in the formulae, a plurality of V are independently substituents selected from

15

the group consisting of -R¹, -OR², -SR³, -OCOR⁴, -COOR⁵, and -SiR⁶R⁷R⁸

(here, R¹ to R⁸ are a C1 to C22 straight-chain, cyclic, or branched alkyl group,

or a C2 to C30 aryl or heteroaryl group), may be identical to or different from

each other, and are bonded to a substitutable position of a quinoline residue,

and each a is independently an integer of 0 to 3; D is selected from the group

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consisting of a single bond and arylene; and E is a divalent linking group

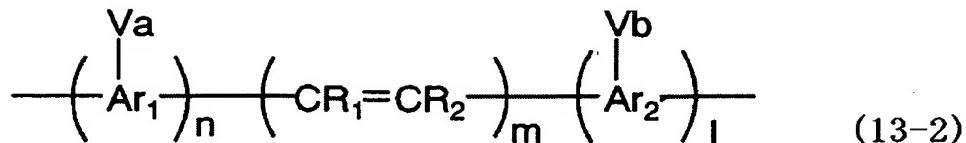
selected from the group consisting of a single bond, -O-, -S-, -C(O)-, -S(O)-, -S(O₂)-, -W-, -(-O-W-)m-O- (m is an integer of 1 to 3), and -Q- [in the formulae, W is a divalent group selected from the group consisting of -Ra-, -Ar'-, -Ra-Ar'-, -Ra'-O-Ra'-, -Ra'-C(O)O-Ra'-, -Ra'-NHCO-Ra'-, -Ra-C(O)-Ra-, -Ar'-C(O)-Ar'-, 5 -Het'-, -Ar'-S-Ar'-, -Ar'-S(O)-Ar'-, -Ar'-S(O₂)-Ar'-, and -Ar'-Q-Ar'-; Ra is alkylene, Ar' is arylene, each Ra' is independently a group selected from the group consisting of alkylene, arylene, and a mixed alkylene/arylene group, Het' is heteroarylene, and Q is a divalent group containing a quaternary carbon], and a substituted or unsubstituted branched monomer unit,

10 the monomer units each being bonded via a linking group represented by Formula (14),

- (G) b - (1 4)

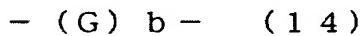
(in the formula, G is a divalent group selected from the group consisting of -O-, -R-O-R-, -S-, -NR-, -CR₂-, -SiR₂-, -SiR₂-O-SiR₂-, and -SiR₂-O-SiR₂-O-SiR₂- 15 (here, R is a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), and b is an integer of 0 or 1).

4. The metal coordination compound-containing copolymer according to Claim 1, wherein the copolymer comprises
 20 a metal coordination compound monomer unit represented by any one of the Formulae (1) to (12), and
 a substituted or unsubstituted conjugated monomer unit represented by Formula (13-2),



(in the formula, Ar_1 and Ar_2 are divalent arylene and/or heteroarylene; a plurality of V , and R_1 and R_2 , are independently substituents selected from the group consisting of $-\text{R}^1$, $-\text{OR}^2$, $-\text{SR}^3$, $-\text{OCOR}^4$, $-\text{COOR}^5$, and $-\text{SiR}^6\text{R}^7\text{R}^8$ (here, R^1 to R^8 are a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), may be identical to or different from each other, and are bonded to a substitutable position of an arylene or heteroarylene residue, and \underline{a} and \underline{b} are independently an integer of 0 or greater; R_1 and R_2 may independently be a hydrogen atom; \underline{n} , \underline{m} , and \underline{l} are independently 0 or 1, and \underline{n} , \underline{m} , and \underline{l} are not simultaneously 0),

the monomer units each being bonded via a linking group represented by Formula (14),

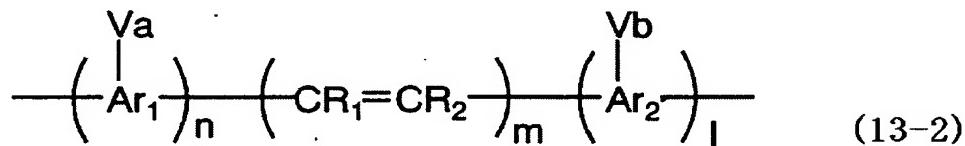


(in the formula, G is a divalent group selected from the group consisting of $-\text{O}-$, $-\text{R}-\text{O}-\text{R}-$, $-\text{S}-$, $-\text{NR}-$, $-\text{CR}_2-$, $-\text{SiR}_2-$, $-\text{SiR}_2-\text{O}-\text{SiR}_2-$, and $-\text{SiR}_2-\text{O}-\text{SiR}_2-\text{O}-\text{SiR}_2-$ (here, R is a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), and \underline{b} is an integer of 0 or 1).

5. The metal coordination compound-containing copolymer according to
20 Claim 1, wherein the copolymer comprises

a metal coordination compound monomer unit represented by any one of the Formulae (1) to (12),

a substituted or unsubstituted conjugated monomer unit represented by Formula (13-2),



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(in the formula, Ar_1 and Ar_2 are divalent arylene and/or heteroarylene; a plurality of V , and R_1 and R_2 , are independently substituents selected from the group consisting of $-\text{R}^1$, $-\text{OR}^2$, $-\text{SR}^3$, $-\text{OCOR}^4$, $-\text{COOR}^5$, and $-\text{SiR}^6\text{R}^7\text{R}^8$ (here, R^1 to R^8 are a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), may be identical to or different from each other, and are bonded to a substitutable position of an arylene or heteroarylene residue, and \underline{a} and \underline{b} are independently an integer of 0 or greater; R_1 and R_2 may independently be a hydrogen atom; \underline{n} , \underline{m} , and \underline{l} are independently 0 or 1, and \underline{n} , \underline{m} , and \underline{l} are not simultaneously 0), and

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a substituted or unsubstituted branched monomer unit,

the monomer units each being bonded via a linking group represented by Formula (14),

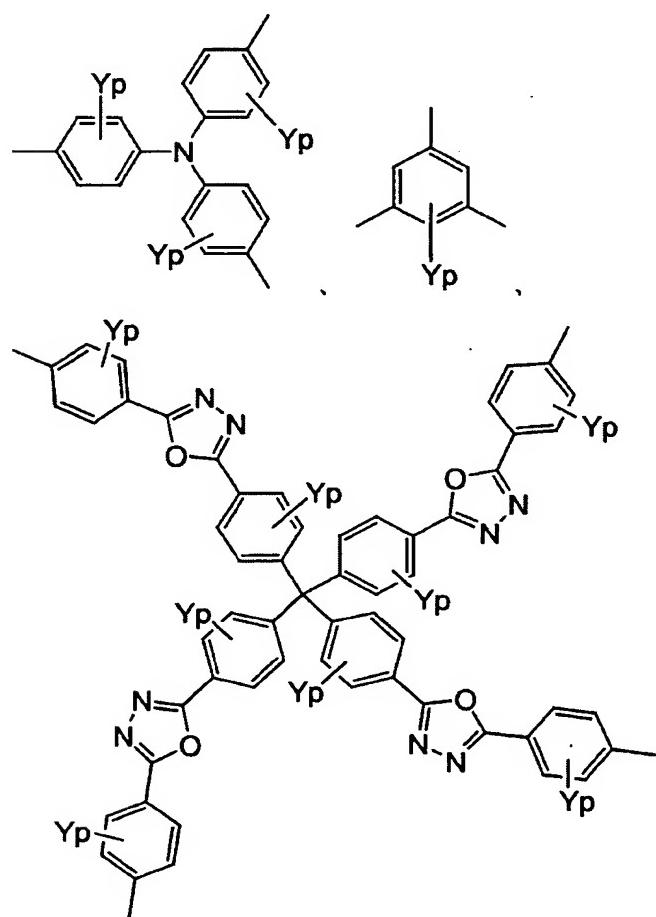


(in the formula, G is a divalent group selected from the group consisting of $-\text{O}-$,

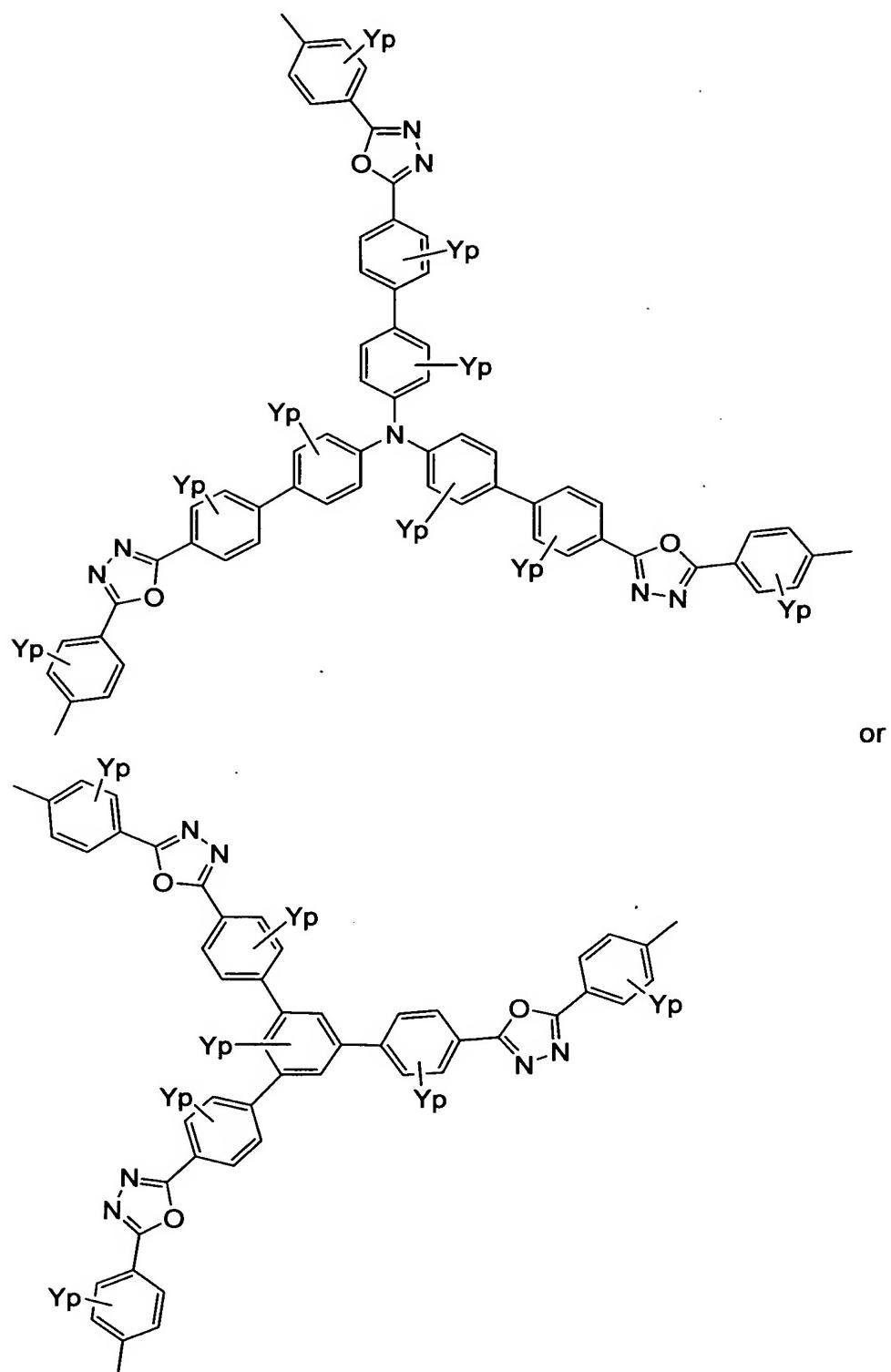
20 $-\text{R-O-R-}$, $-\text{S-}$, $-\text{NR-}$, $-\text{CR}_2-$, $-\text{SiR}_2-$, $-\text{SiR}_2\text{-O-SiR}_2-$, and $-\text{SiR}_2\text{-O-SiR}_2\text{-O-SiR}_2-$

(here, R is a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), and b is an integer of 0 or 1).

6. The metal coordination compound-containing copolymer according to
any one of Claims 1, 3, and 5, wherein the substituted or unsubstituted
branched monomer unit is a branched monomer unit selected from the group
consisting of Formulae (15):



(15)



(in the formulae, a plurality of Y are substituents selected from the group

consisting of -R¹, -OR², -SR³, -OCOR⁴, -COOR⁵, and -SiR⁶R⁷R⁸ (here, R¹ to R⁸ are a C1 to C22 straight-chain, cyclic, or branched alkyl group, or a C2 to C30 aryl or heteroaryl group), may be identical to or different from each other, and are bonded to a substitutable position of a benzene ring having a branched skeleton, and p is an integer of 0 to 4).

7. The metal coordination compound-containing copolymer according to any one of Claims 1 to 6, wherein in the Formulae (1) to (12) ring A is pyridine, quinoline, benzoxazole, benzothiazole, benzimidazole, benzotriazole, imidazole, pyrazole, oxazole, thiazole, triazole, benzopyrazoletriazine, or isoquinoline, which may have a substituent that is the same as the groups defined by X₁ to X₇.

8. The metal coordination compound-containing copolymer according to any one of Claims 1 to 7, wherein in the Formulae (1) to (12) at least one of X₁ to X₇ and the substituent of ring A defined as being the same as X₁ to X₇ is a fluorine atom or a trifluoromethyl group.

9. The metal coordination compound-containing copolymer according to any one of Claims 1 to 8, wherein in the Formulae (1) to (12) M is iridium.

10. A polymer composition comprising the metal coordination compound-containing copolymer according to any one of Claims 1 to 9 and a conjugated or non-conjugated polymer.

11. An organic electroluminescent device fabricated using the metal coordination compound-containing copolymer according to any one of Claims 1 to 9 or the polymer composition according to Claim 10.